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FOREST INSECT SURVEYS
ST. JOE NATIONAL FOREST
1950

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By

Forest Insect Laboratory
Coeur d'Alene, Idaho

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FOREST INSECT SURVEYS
ST. JOE NATIONAL FOREST
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By

Forest Insect Laboratory
Coeur d'Alene, Idaho

The past seasons forest insect survey program on the St. Joe National Forest was limited to the lodgepole pine infestation along the Idaho - Montana Divide and areas of windthrown timber. Because of their entomological importance the examination of these white pine and spruce blowdowns, occupied a position of high priority in our Regional survey program. This importance rests in the ability of windthrown trees, of these two species, to aid in building low beetle populations to epidemic levels. Because of this possibility all white pine and spruce blowdowns were regarded as a potential infestation and a menace to adjacent timber stands.

Windthrown white pine and spruce are attractive hosts for the mountain pine beetle and Engelmann Spruce beetle respectively. As part of their root systems continue to function, white pine trees will remain green and suitable for beetle attack through the subsequent summer season. In most instances spruce will remain as attractive host material through the second summer season. Not only is the inner bark fresh and suitable for bark beetle brood development, but these tipped over trees lose all their resistance to bark beetle attack. This condition permits a few insects, even a pair of beetles, to attack windfalls and produce large broods. Our studies have shown that under normal environmental conditions, the average number of beetles attacking a windfall is about half the number required to overcome the resistance of a standing tree. However the number of beetles emerging from the more lightly attacked windfall is usually equal to the number that emerge from a standing tree. These data were obtained from what would be called normal windfall conditions. With the great number of these down trees now present in our forests, the attacks are in most instances quite light. However the increase potential of this insect in this class of host material is easily recognized.

In planning for the survey of the many blowdown areas throughout the region, it was agreed with the Regional Office of Timber Management that Forest Service data as to the volume of down timber would be used. These volumes to be turned back into numbers of trees. Our task was to determine the percent of windthrown white pine and spruce that harbored bark beetle attacks. This procedure left some things to be desired, but it was the only feasible method that would provide for this unforeseen task.

MONTANA - IDAHO STATE LINE UNIT

In 1948 Mr. Gibson, of this laboratory, reported an infestation of the mountain pine beetle in lodgepole pine along the Montana - Idaho Divide, in the St. Joe National Forest. Mr. Gibson's survey of this situation was of a necessity confined to a few small areas where the presence of red tops (1947 attacks) indicated an abnormal infestation. Data obtained from these areas showed an average infestation of nearly one tree per acre.

In 1949 a resurvey of this situation was made on a somewhat larger scale. At that time some 2700 acres were covered by an intensive, 4 percent strip survey. Data obtained from this acreage, that was divided into four units, varied from .16 to 1.2 infested trees per acre. No control was recommended although the dangerous capabilities were not over looked.

During the past season the need for more complete information concerning the extent and status of this infestation was apparent. To meet this need a 5 percent survey was planned for the general area, which was to be considered as one unit. This unit extends east from Quarles Peak along the south side of the Idaho - Montana Divide to the head of Gold Creek, and is from 2 - 3 miles in width. Data obtained from the survey of this unit, which was under the field supervision of Mr. C. J. Johnson of this laboratory are shown in the following tabulation.

Total acres of unit	10,900	
Acres of sample strip	432	
Percent of area covered by sample strip	4.0	
	Lodgepole Pine	White Pine
Infested trees on sample strip	177	14
Number of infested trees per acre	.41	.03
Total infested trees each species	4469	349
Total infested trees for unit	4,818	

Although the primary host type is lodgepole pine in some portions of the unit, white pine is growing in association with this species. Strip data included both lodgepole and white pine. Infested white pine were usually found in groups of infested lodgepole. Only two attacked white bark pine were recorded. Infested lodgepole occurred as single trees and groups varying from 3 or 4 to as many as 12 or more trees. The infestation is well distributed throughout the area with no apparent concentrations. There is considerable evidence of past losses of lodgepole pine. These old kills can be seen from lookouts and other vantage points as the old snags appear as grey patches.

For an additional check as to condition in the white pine stands south of the unit, Mr. Johnson made an extensive reconnaissance of these areas. During a meandering strip of several miles Mr. Johnson examined 740 white pine trees and 4 white pine windfalls. Of this material only 2 trees and 2 windfalls had been attacked during the current season. These figures show an infestation in standing trees of .0027 percent of the stand, or .005 for both standing trees and windfalls. Good views of this area were obtained to record any abnormal occurrance of red tops (1949 attacks). Only a few were observed, so it can be safely assumed that bark beetle conditions in these white pine stands are not serious at this time.

One's first reaction, after looking at the survey map with the infested trees scattered throughout this acreage, is that control measures are more than warranted. However this would be an expensive answer to the problem, and should not be made until all phases have been properly evaluated. The potential seriousness of this infestation would seem to rest more in the danger of its spread to white pine than in the destruction of the lodgepole stand in question. To predict the future behavior of this infestation is difficult and quite uncertain. We can however attempt to answer the question in the light of what has happened in other areas. As stated past losses in lodgepole indicate a previous epidemic of this beetle, some 15 years ago, that did not spread into white pine. However the question as to what will happen should the lodgepole pine be eleminated by a bark beetle epidemic, remains to be answered. Should such an epidemic occur I feel that we must expect at least a temporary boiling over of the infestation into white pine. However if the infestation remains at its present level, it may run its natural course with no serious loss to white pine. Several years ago in the Silver Creek area of the Oregrande drainage of the Clearwater National Forest, there was a rather heavy infestation in lodgepole of a mixed lodgepole - white pine timber stand. This infestation continued for several years, and in 1940 reached a level of 1.8 of a tree per acre, with no associated damage to white pine. This is only one instance of such an occurrence, but is all the information we have.

Most of the lodgepole pine in the Montana - Idaho Divide Unit are old, low vigor trees, considered as susceptable to bark beetle attack. During the two seasons since the discovery of this infestation there has been no increase in its severity. The 1950 survey showed a much lower infestation for the large area than previously recorded on the smaller units in 1948 and 1949.

If our economic evaluation of this situation is correct then we do not recommend control for 1951. However if it is desired that residual stocking of lodgepole be protected, for fairly immediate utilization, then control measures are in order. The qualifying phrase "for fairly immediate utilization", is used as I do not feel we can economically protect this stand of timber for any extended period of years.

In the event of no control or through survey and reevaluation of this situation must be made in 1951. This project must include the white pine and lodgepole pine areas adjacent to present unit boundaries. This so-called "must" will not be for 1951 only, but will need be continued until the infestation in lodgepole is either ended by natural or artificial control.

EXAMINATIONS OF BLOW DOWN TIMBER AREAS

An attempt was made to examine all blown areas containing appreciable quantities of white pine and spruce where salvage operations were not planned for the current season. These examinations were not an easy assignment. The difficulty of this task cannot be appreciated unless one is familiar with existing ground conditions. Each tree must be examined at intervals along the sides and bottom of the bole until an attack is found, or the tree determined as free of bark beetles. Although time consuming, this examination was not difficult on scattered trees. However where the down trees lay in piled up "Hurrah Nests", it was often necessary to dig through several feet of limbs and brush in order to reach the bole. Not only were these examinations difficult, but the work was dangerous, and we were glad to have this task behind us with no serious accidents on record. The results of our examination of these areas are shown in the following summary tabulation and units remarks. The map which accompanies this report is as submitted by the St. Joe National Forest. In some instances we have made some minor changes, where our data indicated the need for such action. In reality these unit boundaries as shown on the map only delineate the blowdown as visible from the air. No consideration is given to the individual windfalls that are distributed throughout all of these forests and which cannot be seen from the air. These scattered trees may easily be in greater numbers than in the areas of heavier damage.

SUMMARY TABULATION OF DATA
BLOW DOWN AREAS

	Engelmann Spruce			White Pine		
	Trees Examined	Percent Infested	Total Number Infested Trees	Trees Examined	Percent Infested	Total Number Infested Trees
1. Montana Ridge	65	58.5	-	-	-	-
2. Hoodoo Ridge	35	11.4	-	11	45.5	-
3. Lightning	15	20.0	-	-	-	-
4. Dismal Lake	35	37.1	-	-	-	-
5. Bear Skull	33	45.5	-	-	-	-
5A. Bear Skull	62	9.7	-	6	66.6	-
6. Whistling Peak	65	66.2	-	14	71.5	-
7. Webfoot - Forage	74	24.3	-	1	100.0	-
8. Round Top Area	100	84.0	-	11	72.60	-
9. Bonehead Hill	22	9.1	-	64	67.2	-
10. Fortynine Meadows	33	33.1	-	25	88.0	-
11. Head of Homestead	78	46.1	-	1	0	-
12. Daveggio Knob	50	66.0	-	3	33.3	-
12A. Daveggio Knob	25	40.0	-	2	0	-
13. Brush Hill	6	100.0	-	2	100.0	-
14. Elk - Buzzard Creeks	4	100.0	-	-	-	-
15. Mink - Stub Toe	6	100.0	-	-	-	-
16. Mink - Stub Toe	10	100.0	-	2	100.0	-

BLOW DOWN UNIT WRITE UPS

These unit write ups are given for what they may be worth. The data obtained were based on casual observations only, made in connection with the examiners assigned task. We can not vouch for any data concerning volumes, or percent of coverage, as no specific point was made in obtaining it, other than general area notes.

1. Montana Ridge.

No white pine recorded. Estimated that the examination of 65 spruce trees was about 40% of the total number. Average diameter of spruce about 14" D.B.H. Some hemlock, fir, and lodgepole pine down. Attacks of windthrown spruce rather light.

2. Hoodoo Ridge.

Estimated that the 35 spruce examined were 60 percent, and the 11 white pine, 40 percent of the total number of down trees. Attacks were moderate to heavy. Large amounts of down white fir and hemlock. Average diameter of spruce 14" D.B.H., and white pine 18" D.B.H.

3. Lightning Creek.

The 22 spruce trees examined considered as 70 percent of the down spruce. Attacks on spruce were moderate and scattered on the individual trees. Average D.B.H. 16". White fir and hemlock constitute 95 percent of the down timber.

4. Dismal Lake.

Examination of 35 spruce windfalls considered as being 30 percent of the total blowdown of this species. Attacks are moderately heavy in the scattered individual trees, but quite light where they occur in groups.

5. Bear Skull.

The 33 spruce are estimated as being 30 percent of the total number of down trees. These trees have an average diameter of 18 inches, and are lightly attacked.

5A. Bear Skull.

The 62 spruce and 6 white pine examined are considered as comprising 30 percent and 50 percent of the down trees of these two species respectively. Average D.B.H. Spruce 16", and white pine 20". Attacks moderately heavy.

6. Whistling Peak.

An examination of 65 spruce and 14 white pine estimated as being 40 and 80 percent of these two tree species. Windfalls (1949 - 1950) are concentrated in Southern portion of unit, with an old blowdown in the Northern portion. Attacks recorded as light.

7. Webfoot - Forage.

In this area 74 spruce and 1 white pine windfall were examined. Estimated that the 74 trees comprised 40 percent of the total number of down trees. Average diameter 24" D.B.H. Attacks considered as light.

8. Round Top Area.

The 100 spruce and 11 white pine trees examined were considered as 30 and 50 percent of the down trees of these two species. Average D.B.H., spruce 26" and white pine 20". Attacks moderate.

9. Bonehead Hill.

Rather heavy stocking of white pine in this unit. The 22 spruce and 64 white pine trees examined estimated as being 30 and 40 percent of the total number of down trees. Some down lodgepole. Nine trees examined of which 5 were infested. Average D.B.H., spruce 12", white pine 18", and lodgepole pine 10". Attacks moderate to heavy.

10. Fortynine Meadows.

Thirty-three spruce and 25 white pine were examined. This examination was estimated as including 20 percent of the spruce and 30 percent of the white pine. Average D.B.H., spruce 24", and white pine 20". Attacks light to heavy.

11. Head of Homestead Creek Unit.

The 78 spruce windfalls examined comprised 40 percent of the total number. Average D.B.H. 24". Attacks moderate in severity.

12. Daveggio Knob.

Our examination included 50 spruce and 3 white pine. Although only about 50 percent of the total number of down spruce were examined, there were very few white pine trees in the area. Average D.B.H. of the spruce was 18". Attacks light to moderate.

12A. In this unit the examination of 25 spruce windfalls was considered as 70 percent of the total number. Two white pine and 8 white bark pine windfalls were found to be moderately infested. Heavy blowdown of fir and hemlock.

13. Brush Hill.

Only 6 spruce and 2 white pine were examined, but this comprised the total number. All of these trees were moderately infested. Old windfalls in groups throughout this area.

14. Elk - Buzzard Creeks.

Only 4 spruce windfalls found in this area, and they were all infested. In this area one standing white pine was found that was moderately infested.

15 & 15A. Mink-Stub Toe.

No blowdown as shown on map. A few scattered trees throughout the area all of which were infested. One standing infested tree recorded. Large accumulations of old hemlock windfalls may have been mistaken for more recent damage.

In the preceeding remarks a light attack was considered as having from 2 to 20 egg galleries, a moderate attack from 20 to 40, and a heavy attack more than 40 galleries per tree. These attacks are much lower than for standing trees where the attacks, or egg galleries, will average from 7 to 11 per square foot of bark surface. From these much below normal attacks of individual windfalls, one can assume that the bark beetle population was rather well absorbed by this abnormal supply of host material.

RECOMMENDATIONS

Although windfalls are important, this importance alone does not warrant control. Control for a windthrown area of white pine or spruce must be justified by the severity of the bark beetle infestation it represents. They are in the same category as areas of standing infested trees. Windfalls are an attractive bark beetle host and can be successfully attacked by a few beetles. However when once infested they have no greater emergence potential than an infested standing tree. In fact the lightly infested windfalls as recorded on this forest, would not have as great a potential as a standing tree.

Control of blowdown areas even when the number of infested windfalls per acre would seem to warrant such action, is not without further entomological question. For example we know of the concentrated areas of down timber, but we do not know the location or number of windfalls that are scattered throughout the forest. We know they are present, and that they are of importance. Data obtained during our examinations show that the isolated windfall was more heavily infested than those that occurred in groups. These scattered windfalls may well become a greater factor in building epidemic conditions than the so-called blow-down area. However it is necessary that we regard these areas as possible concentrations of subsequent infestations.

In considering the control of lightly attacked windfalls, the expense must be balanced against the numbers of beetles that are destroyed, rather than to place the cost on a tree basis. Each infested windfall will need be treated full length, as the beetle attacks are scattered along the sides and bottom of the bole. This will be expensive, and at least 4 trees will need be treated to destroy the same number of beetles found in one normally infested tree.

To try and present a clearer picture of the seriousness of these blow-down infestations, we have used all information available to us, to compute an infested windfall tree per acre figure. I wish to stress that the results obtained are not significant, but they do help to depict the existing situation. We have used the reaction of the men who made these examinations as to the total number of trees, and the acreage of the areas as shown on the map as submitted by the Forest Supervisor. Both sources of information are subject to question.

Estimated Numbers of Infested Windfalls Per Acre

Unit	Acreage	Infested Trees Per Acre Spruce	White Pine
1. Montana Ridge	370	.26	0
2. Hoodoo Ridge	230	.03	.035
3. Lightining Creek	50	.08	0
4. Dismal Lake	251	.17	0
5. Bear Skull	101	.49	0
5A. Bear Skull	165	.12	.048
6. Whistling Peak	120	.90	.108
7. Webfoot Forage	507	.088	.002
8. Round Top Area	795	.309	.201
9. Bonehead Hill	198	.035	.54
10. Fortynine Meadows	1230	.012	.059
11. Head of Homestead	765	.117	.001
12. Daveggio Knob	92	.71	.012
12A. Daveggio Knob	160	.08	0
13. Brush Hill	585	.01	.003
14. Elk Buzzard	165	.02	0
15. Mink Stub Toe	42	.14	0
15A. Mink Stub Toe	67	.14	.03

White Pine.

The preceeding tabulation shows but one white pine blowdown area (# 9 Bonehead Hill) where the infested windfall tree per acre figure would warrant control. However to reduce this figure of .54 of a tree per acre, to a normally infested tree or windfall, it would not be more than .13. An estimate of the total number of infested windfalls for this unit would not be more than 125. This figure would be safe on the high side. The 1951 emergence from these trees will not infest more than 40 standing trees, and perhaps a much smaller number.

We do not recommend control for this area at this time. In view of the heavily infested windfalls scattered around this area, and in consideration of the expense involved, we do not believe we will experience any economic loss from the non-treatment of these few windfalls. We do recommend that a real effort be made to provide for the removal of these windfalls and infested trees during the 1951 season.

Engelman Spruce.

From an infested windfall per acre figure there are several of these units where control would be warranted. These are # 1 - Montana Ridge, # 5 - Bear Skull, # 6 - Whistling Peak, # 8 - Round Top Area, and

12 - Daveggie Knob. However the same consideration must be given to these trees as shown for white pine. The attacks are light, and the cost of treating under such circumstances would be very high. Furthermore windthrown spruce remain as suitable host for attacks of the Engelman Spruce beetle through the second season. As a result we expect that if there is any beetle emergence from the spruce windfalls attacked in 1950, they will reattack the down material. No control recommended for spruce windfalls in 1951.

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1950

Areas Surveyed and/or Examined

Blowdown Areas Not Examined